

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-339147

(43)Date of publication of application : 08.12.2000

(51)Int.Cl.

G06F 9/06

G06F 17/60

G06F 17/50

(21)Application number : 11-151887

(71)Applicant : MITSUBISHI ELECTRIC CORP

(22)Date of filing : 31.05.1999

(72)Inventor : ISHIKAWA FUJIKO

MINETA TERUO

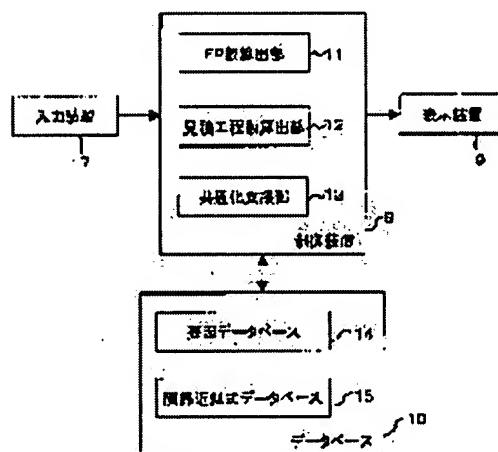
YAMAZAKI TOSHIKAZU

(54) SYSTEM FOR SUPPORTING ESTIMATION OF SOFTWARE DEVELOPMENT COSTS AND RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To improve the precision of estimation by preparing estimation corresponding to various kinds of conditions under development.

SOLUTION: A relation approximate formula database 15 stores a relational approximate formula preliminarily calculated from corresponding result information for each factor information. Then, a controller 8 receives the input of a condition under development and specification information, and calculates the number of FP(function points), and calculates the estimated number of processes by assigning the calculated number of FP to the relational approximate formula corresponding to the factor information matching with the condition.



LEGAL STATUS

[Date of request for examination]

16.02.2001

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than
the examiner's decision of rejection or
application converted registration]

[Date of final disposal for application]

[Patent number] 3654793

[Date of registration] 11.03.2005

[Number of appeal against examiner's
decision of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]

[Claim 1] The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation section of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned, In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation section receives the input of the conditions on a software development in estimated creation time. The related approximate expression matched with said factor information corresponding to the conditions concerned is searched from said related approximate expression database. The estimated support system of the software development cost characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned.

[Claim 2] At the time of completion of software, said inputted amount of software functions and an actual routing counter are made into a group in response to the input of factor information, the amount of software functions, and an actual routing counter. While matching with said factor information and storing in said factor database A related approximate expression is generated from the track record information which searches, corresponds and stores the factor information which is in agreement with the inputted factor information concerned from said factor database. The estimated support system of the software development cost according to claim 1 characterized by matching with said inputted factor information and including the data-base-updating section stored in said related approximate expression database.

[Claim 3] The estimated support system of the software development cost according to claim 2 carry out the data-base-updating section searching the related approximate expression which corresponds from said related approximate expression database to specific factor information with directions, and correcting said related approximate expression which plotted in response to the input of the directions which correct the plotted related approximate expression concerned while plotting and carrying out the display output of the searched related approximate expression concerned, overwriting said related approximate expression database and storing as the description.

[Claim 4] The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record

information, The amount calculation section of software functions which computes the amount of software functions based on the inputted specification information, In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database Said factor database stores the conditions on two or more development as factor information. Said estimated routing counter calculation section receives the input of the conditions on a software development. A track record information retrieval means by which the conditions concerned retrieve the track record information which is in agreement with the conditions shown in said factor information from said factor database, and acquire the group of the track record information on a lot at least, The estimated support system of the software development cost characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on said generated related approximate expression including an approximate expression means to generate a related approximate expression, based on the group of the acquired track record information.

[Claim 5] Claim 1 characterized by having the communalization exchange section which enumerates and carries out the display output of the functional item whose inputted specification information corresponds, or the estimated support system of software development cost according to claim 2, 3, or 4.

[Claim 6] The estimated support system according to claim 5 characterized by deleting the item concerned from said input section in response to assignment of the functional item deleted among the functional items in which said communalization exchange section enumerated and carried out the display output, and outputting to said amount calculation section of software functions as new specification information.

[Claim 7] The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation step of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned, The track record information stored in said factor database is used. In the record medium which stores the estimated support program of the software development cost possessing the estimated routing counter calculation step which computes the estimated routing counter as a result of an estimate based on said amount of software functions and in which computer reading is possible It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation step receives the input of the conditions on a software development in estimated creation time. The record medium which is characterized by searching the related approximate expression matched with said factor information corresponding to the conditions concerned from said factor database, and computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned and in which computer reading is possible.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the estimated support system which computes a routing counter with the amount of software functions based on specification.

[0002]

[Description of the Prior Art] When developing software, specification is drawn up based on the requirement specification presented by the customer, the routing counter according to the development capacity of self is estimated based on this specification, and this determines development costs, such as time for delivery and order volume. as the approach of obtaining the estimate of a routing counter here -- mainly -- LOC -- there are law (Lines of Code law) and an amount method of software functions (FP law; Function Point law). In addition, in the following explanation, the estimated routing counter is expressed as an "estimated routing counter", and it distinguishes from an actual routing counter by it.

[0003] LOC -- the approach of law estimating a production KL number (line count of a program), and changing into an estimated routing counter -- it is -- FP -- law is an approach of estimating the record count of a file, and the number of I/O as the number of functions (FP number; Function Point number), and changing this FP number into an estimated routing counter, without using the line count of a program, and the number of sheets of a document. since a production KL number cannot be immediately estimated from the specification of the program using a graphical user interface (GUI) -- LOC -- law is not suitable for a GUI design. On the other hand, since FP number as the record count of a file or the number of I/O can be estimated from the specification of the program using GUI, in recent years, the FP method suitable for a GUI design attracts attention.

[0004] Hereafter, the process which computes the estimated routing counter of a software development using the FP method concretely is explained. FP number is a fixed numeric value decided according to the number of document items for the number of files shown in specification, the number of the display items for every display screen, and printing etc. For example, the input file used for every processing, an output file, a I / O file, The display item for an input, the display item for an output, the display item for I/O, A menu display item, the item of each function classified into eight kinds of documents What resembled the number of (calling it a "functional item" hereafter), respectively, and summarized the difficulty of the receiving processing in the table is created based on specification. The numeric value (FP number reduced property) which evaluated complexity and were beforehand decided to be every [of each functional item] classification ("input file" etc.) from some of numbers concerned and the difficulty of processing according to each evaluation ("it is simple") Each number of files, It takes advantaging of each number of items, such as the number of display items, and the number of documents, and let what carried out accumulation further be FP number. Here, the number of functional items is equivalent to the number of the data read by the input file.

[0005] "concrete -- the number of each functional items -- it is few" -- "-- usually -- " -- the three-stage of "a many" -- evaluating -- the same -- the difficulty of processing -- "***" -- the three-stage of "difficulty" "usually" estimates. the table (complexity matrix) on which complexity expressed the

complexity to some of numbers of functional items, and the difficulty of processing -- drawing 11 (a) -- like -- beforehand -- setting -- this complexity matrix -- referring to -- "simple" -- a "complicated" three-stage "usually" estimates. Similarly, FP number reduced property is beforehand defined, as shown in the table (FP number calculation table) shown in drawing 11 (b). Drawing 11 is an explanatory view showing an example of the table for computing the amount of software functions.

[0006] Next, the conventional estimated support system is explained. Drawing 12 is the configuration block Fig. of the conventional estimated support system, and drawing 13 is an explanatory view showing the input item in the conventional estimated support system. As shown in drawing 12, the conventional estimated support system mainly consists of the input device 1, a control device 2 possessing the complexity matrix and FP number calculation table which were shown in drawing 11, an indicating equipment 3, and a factor database 4. Moreover, a control unit 2 contains FP number calculation section 5 and the estimated routing counter calculation section 6. The factor database 4 makes a group the FP number of the past specific development projects, and the actual routing counter corresponding to it, and stores them in every [showing the tool used for development] information (factor information) as track record information.

[0007] A control unit 2 receives the input of some of number of the functional items, and the difficulty of processing, as each of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and a document is shown in drawing 13 from an input unit 1. Concretely, for every processing, processing of Screen 1 - Screen 7 is performed, and processing of Screen 1 expresses that the menu display item whose difficulty of processing the number of items is "common" in "it is common" is displayed in drawing 13 at processing of a "screen."

[0008] a control unit 2 -- every processing -- a complexity matrix -- being based -- the number of items, and the difficulty of processing to complexity -- "simple" -- a "complicated" three-stage "usually" estimates. For example, since the difficulty of processing is "common", the number of items is "usually" estimated that complexity is "common" by processing of Screen 1 from the complexity matrix shown in drawing 11 (a). Moreover, FP number calculation section 5 of this control section 2 counts the number of each functional items for every complexity. In drawing 13, the number of the input files (FI) whose complexity is "simple" is concretely counted among "2." FP number calculation section 5 of a control device 2 carries out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value which carried out in this way and was counted, and calculates those sums further. According to complexity, when the number of "2" and ordinary input files is [the number of "5" and complicated input files] "4", the number of simple input files specifically As shown in FP number calculation table of drawing 11 (b), FP number reduced property to a simple input file "3", Since FP number reduced property [as opposed to "5" and a complicated input file in FP number reduced property to an ordinary input file] is "8", $2 \times 3 + 5 \times 5 + 4 \times 8 = 63$ calculate as a subtotal of FP number about an input file. Like the following, about eight kinds of each functional items, the subtotal of FP number is computed and the whole FP number is obtained as total of these subtotals. Furthermore, the estimated routing counter calculation section 6 of this control unit 2 When the tool concerned is used in response to the information showing the class of tools ("C", "Java language", etc.) used for development as factor information from an input unit 1 The track record information showing the routing counter of which was required as a past track record is retrieved from the factor database 4, based on the retrieved track record information, with the formula set up beforehand, FP number is changed into an estimated routing counter, and a display output is carried out to a display 3.

[0009] When becoming larger than what there were too many estimated routing counters obtained by conversion here, for example, order volume was required as, in order to hold down order volume, an operator looks at and chooses the functional item which can be reduced by the eye, specification is rewritten, and it repeats from the input of the number of functional items anew.

[0010] In addition, the technique which computes an estimate is indicated by JP,9-198441,A, and "estimated equipment and the estimated approach" as an example of the estimated equipment using the FP method based on the past track record according to the information of a tool and a development person in charge. Moreover, the technique which re-calculates an estimate according to a progress

situation is indicated by JP,8-202773,A and "software project advance management equipment."

[0011]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional estimated support system, since the estimated routing counter calculation section which changes FP number into an estimated routing counter used only the factor information to which the class was restricted, the estimated routing counter was computed according to the concrete situation, and there was a trouble that an estimated precision could not be raised.

[0012] Moreover, in the above-mentioned conventional estimated support system, since flexible approximation according to track record information was omitted only by the parameter of the formula concerned changing even if it was inputting track record information, since the formula which changes FP number into an estimated routing counter was assumed theoretically and defined beforehand, there was a trouble that an estimated precision could not be raised.

[0013] Furthermore, in the above-mentioned conventional estimated support system, when a specification was reconfigured, the operator needed to choose the item which looks at specification information by the eye, and is reduced, needed to draw up specification once again, needed to do the input for the second time, and there was a trouble that an estimate could not be obtained efficiently.

[0014] This invention was made in order to solve the above technical problems, and it aims at offering the estimated support system and record medium which can obtain the estimate of a high precision efficiently.

[0015]

[Means for Solving the Problem] In the estimated support system of the software development cost concerning this invention The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation section of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned, In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation section receives the input of the conditions on a software development in estimated creation time. The related approximate expression matched with said factor information corresponding to the conditions concerned is searched from said related approximate expression database, and it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned.

[0016] Moreover, it sets to the estimated support system of the software development cost concerning this invention. At the time of completion of software, said inputted amount of software functions and an actual routing counter are made into a group in response to the input of factor information, the amount of software functions, and an actual routing counter. While matching with said factor information and storing in said factor database A related approximate expression is generated from the track record information which searches, corresponds and stores the factor information which is in agreement with the inputted factor information concerned from said factor database. It is characterized by matching with said inputted factor information and including the data-base-updating section stored in said related approximate expression database.

[0017] Moreover, it sets to the estimated support system of the software development cost concerning this invention. While the data-base-updating section searches the related approximate expression which corresponds to specific factor information from said related approximate expression database with

directions and plots and carries out the display output of the searched related approximate expression concerned. It is characterized by correcting said plotted related approximate expression, overwriting said related approximate expression database and storing in it in response to the input of the directions which correct the plotted related approximate expression concerned.

[0018] Moreover, it sets to the estimated support system of the software development cost concerning this invention. The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information. The amount calculation section of software functions which computes the amount of software functions based on the inputted specification information. In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database. Said factor database stores the conditions on two or more development as factor information. Said estimated routing counter calculation section receives the input of the conditions on a software development. A track record information retrieval means by which the conditions concerned retrieve the track record information which is in agreement with the conditions shown in said factor information from said factor database, and acquire the group of the track record information on a lot at least. Based on the group of the acquired track record information, it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on said generated related approximate expression including an approximate expression means to generate a related approximate expression.

[0019] Moreover, in the estimated support system of the software development cost concerning this invention, it is characterized by having the communalization exchange section which enumerates and carries out the display output of the functional item whose inputted specification information corresponds.

[0020] Moreover, in the estimated support system of the software development cost concerning this invention, in response to assignment of the functional item deleted among the functional items in which said communalization exchange section enumerated and carried out the display output, the item concerned is deleted from said input section, and it is characterized by outputting to said amount calculation section of software functions as new specification information.

[0021] Furthermore, it sets to the record medium which stores the estimated support program of the software development cost concerning this invention and in which computer reading is possible. The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information. The amount calculation step of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned. The track record information stored in said factor database is used. In the record medium which stores the estimated support program of the software development cost possessing the estimated routing counter calculation step which computes the estimated routing counter as a result of an estimate based on said amount of software functions and in which computer reading is possible. It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation step receives the input of the conditions on a software development in estimated creation time. The related approximate expression matched with said factor information corresponding to the conditions concerned is searched from said factor database, and it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned.

[0022]

[Embodiment of the Invention] The gestalt of desirable operation of this invention is explained based on a drawing.

[0023] Gestalt 1. drawing 1 of operation is the configuration block Fig. of the estimated support system concerning the gestalt 1 of desirable operation of this invention. The estimated support system concerning the gestalt 1 of desirable operation of this invention mainly consists of databases 10 possessing an input device 7, the control device 8 possessing the complexity matrix and FP number calculation table which were shown in drawing 11, an indicating equipment 9, and the factor database 14 and the related approximate expression database 15, as shown in drawing 1. Moreover, a control unit 8 contains FP number calculation section 11, the estimated routing counter calculation section 12, and the communalization exchange section 13 as the amount calculation section of software functions of this invention.

[0024] FP number [in / in every / as factor information in which the factor database 14 includes two or more conditions as shown in drawing 2 (a) / factor Flagg (A) / the past development track record], The track record information (B) which made the routing counter the group is stored, and as the related approximate expression database 15 is shown in drawing 2 (b), the related approximate expression (D) beforehand computed from the track record information corresponding to every [as factor information] factor Flagg (C) is stored. Here, FP number is equivalent to the amount of software functions of this invention. Moreover, the routing counter is indicated as a "man day." Drawing 2 is an explanatory view showing the contents of the database 10 of the gestalt 1 of operation of this invention. In addition, although he is trying to store what is equivalent to the ID number of a related approximate expression for every factor information in drawing 2 (b), you may make it store the parameter of a related approximate expression itself.

[0025] Moreover, as two or more conditions for factor information, there is a scale of the information about the field of the invention of for example, development software, the development experience and operating knowledge, and software etc. besides the language ("C", "Java language", etc.) used for development, the version information of those, etc. It is not necessary to necessarily specify the conditions of factor information altogether, and they may be alternatively specified combining conditions. Thus, it uses for arbitration for raising an estimated precision as factor information combining various conditions. In addition, in order to make retrieval easy, it is desirable to express the monograph affair of factor information as 1-bit factor Flagg. A related approximate expression is a formula obtained by performing interpolation and extrapolation based on track record information. Here, a well-known approach is used as the approach of interpolation and extrapolation.

[0026] Hereafter, actuation of the gestalt 1 of operation of this invention is explained about each at estimated creation time and the time of development termination of software. First, actuation of an estimated generate time is explained.

[0027] A control unit 8 performs processing as shown in drawing 3 as processing which computes an estimated routing counter. Drawing 3 is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 8, and drawing 4 is an explanatory view showing the input item to the estimated support system concerning the gestalt 1 of operation of this invention. As shown in drawing 3, a control unit 8 is in the condition of a chart as indicated to be a processing name to drawing 4 as a functional item in each processing from an input unit 7, and receives the input of some of names of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and the functional item of a document, number of the functional items concerned, and the difficulty of processing (S1). Hereafter, this input item will be called a "questionnaire." Concretely, for every processing, processing of "form information screen" - "Screen 7" is performed as a name of a functional item, and processing of a form information screen expresses that the menu display item whose difficulty of processing the number of items is "common" in "it is common" is displayed in drawing 4 at processing of a "screen."

[0028] a control unit 8 -- a complexity matrix -- being based -- the complexity of the publication of a questionnaire to each functional item -- "simple" -- a "complicated" three-stage "usually" estimates (S2).

For example, since the difficulty of processing is "common", the number of items is "usually" estimated that complexity is "common" by processing of "form information screen" from the complexity matrix shown in drawing 11 (a). Moreover, FP number calculation section 11 of this control unit 8 counts the number of each functional items for every complexity (S3). In drawing 3, the number of the input files (FI) whose complexity is "simple" is concretely counted among "2." It computes the total FP number by FP number calculation section 11 of a control unit 8 carrying out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value which carried out in this way and was counted, and calculating those sums further (S4). According to complexity, when the number of "2" and ordinary input files is [the number of "5" and complicated input files] "4", the number of simple input files specifically As shown in FP number calculation table of drawing 11 (b), FP number reduced property to a simple input file "3", Since FP number reduced property [as opposed to "5" and a complicated input file in FP number reduced property to an ordinary input file] is "8", $2 \times 3 + 5 \times 5 + 4 \times 8 = 63$ calculate as a subtotal of FP number about an input file. Like the following, about eight kinds of each functional items, the subtotal of FP number is computed and the total FP number is obtained as total of these subtotals. The information showing the class of tools ("C", "Java language", etc.) which use the estimated routing counter calculation section 12 of a control unit 8 for development from an input unit 7, The information showing the existence of development experience, the existence of operating knowledge, the size of a scale, etc. is received as factor information. The related approximate expression corresponding to the factor information concerned is searched from the related approximate expression database 15 (S5), an estimated routing counter is computed by applying the whole FP number to the related approximate expression concerned (S6), and processing is ended.

[0029] When becoming larger than what there were too many estimated routing counters computed in processing S6, for example, order volume was required as, a user starts the communalization exchange section 13 of a control unit 8. The communalization exchange section 13 of a control unit 8 performs processing as shown in drawing 5. Drawing 5 is a flow chart Fig. showing processing of communalization exchange of the communalization exchange section 13. About each of a functional item inputted as a questionnaire, the communalization exchange section 13 is added to a communalization candidate table as shows drawing 6 whether there is the same name or a functional item of the same classes (for example, "input file" etc.) if it searches (S11) and there are such two or more functional items (if it becomes Yes) (S12), and shifts to processing S13. Moreover, in processing S11, if such a functional item is not searched, it investigated whether the retrieval about all functional items was completed (when becoming No) (S13) and retrieval is completed, it shifts to processing S14, and if it has not ended, it will return to processing S11 and processing will be continued (if it becomes No). (if it becomes Yes) Drawing 6 is an explanatory view showing an example of a communalization candidate table.

[0030] If retrieval ends the communalization exchange section 13 and generation of a communalization candidate table is completed, the display output of the communalization candidate table concerned will be carried out to a display 9 (S14). This communalization exchange section 13 investigates whether it is the assignment which deletes some functional items as which it stood by (S15) and the inputted directions displayed the directions from a user by processing S14 again (S16), and the functional item instructed to be the directions to delete from the communalization candidate table deletes (S17), it returns to processing S15 further, and it stands by directions (it is Yes). Moreover, if it is not the directions deleted in processing S16 (it is No), it investigates whether directions are directions of termination (S18), and if it is not directions of termination, it will return to processing S15 and directions will be stood by (if it is No), if it is directions of termination, a questionnaire will be re-created according to a communalization candidate table (if it is Yes) (S19), and processing termination will be carried out. And the estimate shown in drawing 3 is processed, and based on the reconstructed questionnaire, a control unit 8 computes FP number once again, and computes an estimated routing counter further.

[0031] Next, the processing at the time of software-development termination of the gestalt of this operation is explained. Drawing 7 is a flow chart Fig. showing the processing at the time of software-

development termination of the gestalt of this operation.

[0032] After development of software is completed, a control unit 8 The factor information as conditions on development of the software which the development concerned ended from the input unit 7, In response to the input of actual FP number and an actual routing counter (S21), the group of the track record information corresponding to the inputted factor information is searched and extracted from the factor database 14 (S22). The track record information concerned, The display output of the actual routing counter to actual FP number newly inputted by processing S21 is carried out to a display 9 as a scatter diagram (S23). By the well-known interpolation and extrapolation approach Interpolation and extrapolation of the data displayed in the scatter diagram concerned are done, a related approximate expression is generated (S24), a related approximate expression is combined, and a display output is carried out to a display 9.

[0033] A user adds correction to a related approximate expression here, when thinking that the related approximate expression by which the display output was carried out to the display 9 does not suit an actual situation. A part of graph of the related approximate expression displayed on the display 9 is specifically dragged, and the parameter of interpolation and extrapolation is adjusted. If the control unit 8 judged whether the input of correction of a related approximate expression was received (S25) and has received the input of correction, it will return to processing S24, will adjust the parameter of interpolation and extrapolation, will re-calculate a related approximate expression, and it will carry out a display output to a display 9 anew (if it becomes Yes). Moreover, in processing S25, if the input of correction is not received, (if it becomes No) If the directions which judge whether the input of the directions which end processing was received (S26), and end processing are not received, (if it becomes No) If the directions which return to processing S25, continue processing, and end processing are received, (if it becomes Yes) The current related approximate expression corresponding to the factor information inputted by processing S21 is searched from the related approximate expression database 15, the related approximate expression generated by processing S24 is overwritten and stored in the related approximate expression concerned (S27), and processing is ended.

[0034] Since the estimated routing counter is computed using the related approximate expression which could treat two or more conditions as factor information, and was beforehand generated based on the track record information on past according to the gestalt of this operation, an estimated precision can be improved. Moreover, since a related approximate expression is anew readjusted based on actual FP number and the actual routing counter of software which newly ended development at the time of termination of development, the precision of the estimate from next time can be improved.

[0035] Furthermore, according to the gestalt of this operation, by work of the communalization exchange section 13, the duplicate function can be made to be able to show, specification can be made to be able to reconfigure based on directions, and an estimate can be created efficiently.

[0036] Although [the gestalt 1 of operation of the gestalt 2. above of operation] a related approximate expression is beforehand generated and stored for every factor information, when computing an estimated routing counter, it is also desirable to search and generate a related approximate expression based on factor information, and to use the generated related approximate expression concerned. Then, when computing an estimated routing counter, the estimated support system of the software development cost concerning the gestalt 2 of operation of this invention which generates a related approximate expression is explained below.

[0037] The estimated support system concerning the gestalt of this operation is explained referring to a drawing below. In addition, the same sign is attached and explained about the part used as the same configuration as the estimated support system concerning the gestalt 1 of operation shown in drawing 1. Drawing 8 is the configuration block Fig. of the estimated support system concerning the gestalt 2 of desirable operation of this invention. As shown in drawing 8, it mainly consists of the input device 7, a control device 16, an indicating equipment 9, and a database 17. Here, a control unit 16 contains FP number calculation section 11, the estimated routing counter calculation section 12, and the communalization exchange section 13. Moreover, a database 17 contains the factor database 14. In addition, since the contents of the factor database 14 are the same as that of the thing concerning the

gestalt 1 of operation of this invention shown in drawing 2 (a), explanation is omitted.

[0038] Hereafter, actuation of the gestalt 2 of operation of this invention is explained about each at estimated creation time and the time of development termination of software. First, actuation of an estimated generate time is explained.

[0039] A control unit 16 performs processing as shown in drawing 9 as processing which computes an estimated routing counter. Drawing 9 is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 16. As shown in drawing 9, a control unit 16 is in the condition of a chart as indicated to be a processing name to drawing 4 as a functional item in each processing from the input unit 7, and receives the input (the input of a questionnaire) of some of names of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and the functional item of a document, number of the functional items concerned, and the difficulty of processing (S31).

[0040] a control unit 16 -- a complexity matrix -- being based -- the complexity of the publication of a questionnaire to each functional item -- "simple" -- a "complicated" three-stage estimates (S32) and the number of each functional items for every complexity is "usually" counted by FP number calculation section 11 (S33). It computes the total FP number by FP number calculation section 11 carrying out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value for every functional item counted by processing S33, and calculating those sums further (S34). Moreover, the estimated routing counter calculation section 12 acquires the track record information stored corresponding to the factor information concerned from an input unit 7 in response to the input of factor information (S35), and this control unit 16 generates the related approximate expression as a formula showing the estimated routing counter to FP number by the well-known interpolation and extrapolation approach based on the acquired track record information concerned (S36). And a control unit 16 computes an estimated routing counter by applying the total FP number computed by processing S34 to the related approximate expression generated by processing S36, it carries out a display output to a display 9 (S37), and it ends processing.

[0041] Since it is the same as that of the estimated support system concerning the gestalt 1 of operation of this invention to process communalization as shown in drawing 5 with directions of a user when becoming larger than what there were too many estimated routing counters computed in this processing S37, for example, order volume was required as, that explanation is omitted.

[0042] Next, the processing at the time of software-development termination of the gestalt of this operation is explained. Drawing 10 is a flow chart Fig. showing the processing at the time of software-development termination of the gestalt of this operation.

[0043] After development of software is completed, a control unit 16 The factor information as conditions on development of the software which the development concerned ended from the input unit 7, In response to the input of actual FP number and an actual routing counter (S41), the inputted FP number concerned and an actual routing counter are made into a group, are matched with the inputted factor information, it stores in the factor database 14 (S42), and processing is ended.

[0044] Since according to the gestalt of this operation two or more conditions can be treated as factor information, and a related approximate expression is generated based on the track record information on past and the estimated routing counter is computed using this, an estimated precision can be improved. Moreover, since track record information is accumulated based on actual FP number and the actual routing counter of software which newly ended development at the time of termination of development, the precision of the estimate from next time can be improved.

[0045] Furthermore, according to the gestalt of this operation, by work of the communalization exchange section 13, the duplicate function can be made to be able to show, specification can be made to be able to reconfigure based on directions, and an estimate can be created efficiently.

[0046] In addition, in the gestalt 1 of operation, and the gestalt 2 of operation, although the case where the estimate of a routing counter was created was explained, if the number of the trial items of software, the number of detection of the error in a trial, etc. are accumulated instead of a routing counter as track record information, it is also possible to create the estimate of these numeric values.

[0047] It is also possible to realize the gestalt 1 of operation and the gestalt 2 of operation to the gestalt 3. pan of operation as a program of a computer, and to store this in it at the record medium in which a computer readout is possible.

[0048]

[Effect of the Invention] Since this invention is constituted as explained above, it does effectiveness as taken below so.

[0049] The related approximate expression showing the estimated routing counter according to the amount of software functions is generated and accumulated for every development track record of the past in the specific conditions shown in factor information. The amount of software functions computed from specification information in response to the input of specification information by estimated creation time is computed. The related approximate expression in the conditions corresponding to the conditions on development is searched, since the estimated routing counter is computed to the searched related approximate expression by applying the computed amount of software functions to it, the estimate according to the various conditions on development can be created to it, and an estimated precision can be raised to it.

[0050] Moreover, the precision of the estimate from next time can be raised more by generating and updating the related approximate expression according to the factor information in response to the input of factor information, the amount of software functions, and an actual routing counter at the time of completion of software.

[0051] Furthermore, a related approximate expression can be plotted with directions, a display output can be carried out, and an estimated precision can be raised more by correcting a related approximate expression, and overwriting and storing it in response to the input of directions of correction.

[0052] Moreover, according to this invention according to claim 4, the factor information on the past development track record is received. Match the group of the amount of software functions, and a routing counter, and it stores as track record information. In response to the input of specification information, compute the amount of software functions to estimated creation time, retrieve the track record information on the conditions corresponding to the conditions on development, and a related approximate expression is generated from track record information. By computing an estimated routing counter by applying the computed amount of software functions, the estimate according to the various conditions on development can be created, and an estimated precision can be raised.

[0053] Furthermore, by enumerating and displaying the functional item whose inputted specification information corresponds, reconstruction of a specification can be made easy and an estimate can be obtained efficiently.

[0054] Furthermore, an estimate can be efficiently obtained by computing an estimated routing counter based on the new specification information which deleted the functional item concerned in response to the appointed input of the functional item deleted from the enumerated functional item.

[0055] Furthermore, this estimated support system can be realized as a program of a computer, and the efficient high estimate of precision can be obtained as a record medium in which a computer readout is possible.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the estimated support system which computes a routing counter with the amount of software functions based on specification.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art] When developing software, specification is drawn up based on the requirement specification presented by the customer, the routing counter according to the development capacity of self is estimated based on this specification, and this determines development costs, such as time for delivery and order volume. as the approach of obtaining the estimate of a routing counter here -- mainly -- LOC -- there are law (Lines of Code law) and an amount method of software functions (FP law; Function Point law). In addition, in the following explanation, the estimated routing counter is expressed as an "estimated routing counter", and it distinguishes from an actual routing counter by it. [0003] LOC -- the approach of law estimating a production KL number (line count of a program), and changing into an estimated routing counter -- it is -- FP -- law is an approach of estimating the record count of a file, and the number of I/O as the number of functions (FP number; Function Point number), and changing this FP number into an estimated routing counter, without using the line count of a program, and the number of sheets of a document. since a production KL number cannot be immediately estimated from the specification of the program using a graphical user interface (GUI) -- LOC -- law is not suitable for a GUI design. On the other hand, since FP number as the record count of a file or the number of I/O can be estimated from the specification of the program using GUI, in recent years, the FP method suitable for a GUI design attracts attention.

[0004] Hereafter, the process which computes the estimated routing counter of a software development using the FP method concretely is explained. FP number is a fixed numeric value decided according to the number of document items for the number of files shown in specification, the number of the display items for every display screen, and printing etc. For example, the input file used for every processing, an output file, a I / O file, The display item for an input, the display item for an output, the display item for I/O, A menu display item, the item of each function classified into eight kinds of documents What resembled the number of (calling it a "functional item" hereafter), respectively, and summarized the difficulty of the receiving processing in the table is created based on specification. The numeric value (FP number reduced property) which evaluated complexity and were beforehand decided to be every [of each functional item] classification ("input file" etc.) from some of numbers concerned and the difficulty of processing according to each evaluation ("it is simple") Each number of files, It takes advantaging of each number of items, such as the number of display items, and the number of documents, and let what carried out accumulation further be FP number. Here, the number of functional items is equivalent to the number of the data read by the input file.

[0005] "concrete -- the number of each functional items -- it is few" -- "-- usually -- " -- the three-stage of "a many" -- evaluating -- the same -- the difficulty of processing -- "***" -- the three-stage of "difficulty" "usually" estimates. the table (complexity matrix) on which complexity expressed the complexity to some of numbers of functional items, and the difficulty of processing -- drawing 11 (a) -- like -- beforehand -- setting -- this complexity matrix -- referring to -- "simple" -- a "complicated" three-stage "usually" estimates. Similarly, FP number reduced property is beforehand defined, as shown in the table (FP number calculation table) shown in drawing 11 (b). Drawing 11 is an explanatory view showing an example of the table for computing the amount of software functions.

[0006] Next, the conventional estimated support system is explained. Drawing 12 is the configuration block Fig. of the conventional estimated support system, and drawing 13 is an explanatory view showing the input item in the conventional estimated support system. As shown in drawing 12, the conventional estimated support system mainly consists of the input device 1, a control device 2 possessing the complexity matrix and FP number calculation table which were shown in drawing 11, an indicating equipment 3, and a factor database 4. Moreover, a control unit 2 contains FP number calculation section 5 and the estimated routing counter calculation section 6. The factor database 4 makes a group the FP number of the past specific development projects, and the actual routing counter corresponding to it, and stores them in every [showing the tool used for development] information (factor information) as track record information.

[0007] A control unit 2 receives the input of some of number of the functional items, and the difficulty of processing, as each of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and a document is shown in drawing 13 from an input unit 1. Concretely, for every processing, processing of Screen 1 - Screen 7 is performed, and processing of Screen 1 expresses that the menu display item whose difficulty of processing the number of items is "common" in "it is common" is displayed in drawing 13 at processing of a "screen."

[0008] a control unit 2 -- every processing -- a complexity matrix -- being based -- the number of items, and the difficulty of processing to complexity -- "simple" -- a "complicated" three-stage "usually" estimates. For example, since the difficulty of processing is "common", the number of items is "usually" estimated that complexity is "common" by processing of Screen 1 from the complexity matrix shown in drawing 11 (a). Moreover, FP number calculation section 5 of this control section 2 counts the number of each functional items for every complexity. In drawing 13, the number of the input files (FI) whose complexity is "simple" is concretely counted among "2." FP number calculation section 5 of a control device 2 carries out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value which carried out in this way and was counted, and calculates those sums further. According to complexity, when the number of "2" and ordinary input files is [the number of "5" and complicated input files] "4", the number of simple input files specifically As shown in FP number calculation table of drawing 11 (b), FP number reduced property to a simple input file "3", Since FP number reduced property [as opposed to "5" and a complicated input file in FP number reduced property to an ordinary input file] is "8", $2 \times 3 + 5 \times 5 + 4 \times 8 = 63$ calculate as a subtotal of FP number about an input file. Like the following, about eight kinds of each functional items, the subtotal of FP number is computed and the whole FP number is obtained as total of these subtotals. Furthermore, the estimated routing counter calculation section 6 of this control unit 2 When the tool concerned is used in response to the information showing the class of tools ("C", "Java language", etc.) used for development as factor information from an input unit 1 The track record information showing the routing counter of which was required as a past track record is retrieved from the factor database 4, based on the retrieved track record information, with the formula set up beforehand, FP number is changed into an estimated routing counter, and a display output is carried out to a display 3.

[0009] When becoming larger than what there were too many estimated routing counters obtained by conversion here, for example, order volume was required as, in order to hold down order volume, an operator looks at and chooses the functional item which can be reduced by the eye, specification is rewritten, and it repeats from the input of the number of functional items anew.

[0010] In addition, the technique which computes an estimate is indicated by JP,9-198441,A, and "estimated equipment and the estimated approach" as an example of the estimated equipment using the FP method based on the past track record according to the information of a tool and a development person in charge. Moreover, the technique which re-calculates an estimate according to a progress situation is indicated by JP,8-202773,A and "software project advance management equipment."

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Invention] Since this invention is constituted as explained above, it does effectiveness as taken below so.

[0049] The related approximate expression showing the estimated routing counter according to the amount of software functions is generated and accumulated for every development track record of the past in the specific conditions shown in factor information. The amount of software functions computed from specification information in response to the input of specification information by estimated creation time is computed. The related approximate expression in the conditions corresponding to the conditions on development is searched, since the estimated routing counter is computed to the searched related approximate expression by applying the computed amount of software functions to it, the estimate according to the various conditions on development can be created to it, and an estimated precision can be raised to it.

[0050] Moreover, the precision of the estimate from next time can be raised more by generating and updating the related approximate expression according to the factor information in response to the input of factor information, the amount of software functions, and an actual routing counter at the time of completion of software.

[0051] Furthermore, a related approximate expression can be plotted with directions, a display output can be carried out, and an estimated precision can be raised more by correcting a related approximate expression, and overwriting and storing it in response to the input of directions of correction.

[0052] Moreover, according to this invention according to claim 4, the factor information on the past development track record is received. Match the group of the amount of software functions, and a routing counter, and it stores as track record information. In response to the input of specification information, compute the amount of software functions to estimated creation time, retrieve the track record information on the conditions corresponding to the conditions on development, and a related approximate expression is generated from track record information. By computing an estimated routing counter by applying the computed amount of software functions, the estimate according to the various conditions on development can be created, and an estimated precision can be raised.

[0053] Furthermore, by enumerating and displaying the functional item whose inputted specification information corresponds, reconstruction of a specification can be made easy and an estimate can be obtained efficiently.

[0054] Furthermore, an estimate can be efficiently obtained by computing an estimated routing counter based on the new specification information which deleted the functional item concerned in response to the appointed input of the functional item deleted from the enumerated functional item.

[0055] Furthermore, this estimated support system can be realized as a program of a computer, and the efficient high estimate of precision can be obtained as a record medium in which a computer readout is possible.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional estimated support system, since the estimated routing counter calculation section which changes FP number into an estimated routing counter used only the factor information to which the class was restricted, the estimated routing counter was computed according to the concrete situation, and there was a trouble that an estimated precision could not be raised.

[0012] Moreover, in the above-mentioned conventional estimated support system, since flexible approximation according to track record information was omitted only by the parameter of the formula concerned changing even if it was inputting track record information, since the formula which changes FP number into an estimated routing counter was assumed theoretically and defined beforehand, there was a trouble that an estimated precision could not be raised.

[0013] Furthermore, in the above-mentioned conventional estimated support system, when a specification was reconfigured, the operator needed to choose the item which looks at specification information by the eye, and is reduced, needed to draw up specification once again, needed to do the input for the second time, and there was a trouble that an estimate could not be obtained efficiently.

[0014] This invention was made in order to solve the above technical problems, and it aims at offering the estimated support system and record medium which can obtain the estimate of a high precision efficiently.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem] In the estimated support system of the software development cost concerning this invention The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation section of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned, In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation section receives the input of the conditions on a software development in estimated creation time. The related approximate expression matched with said factor information corresponding to the conditions concerned is searched from said related approximate expression database, and it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned.

[0016] Moreover, it sets to the estimated support system of the software development cost concerning this invention. At the time of completion of software, said inputted amount of software functions and an actual routing counter are made into a group in response to the input of factor information, the amount of software functions, and an actual routing counter. While matching with said factor information and storing in said factor database A related approximate expression is generated from the track record information which searches, corresponds and stores the factor information which is in agreement with the inputted factor information concerned from said factor database. It is characterized by matching with said inputted factor information and including the data-base-updating section stored in said related approximate expression database.

[0017] Moreover, it sets to the estimated support system of the software development cost concerning this invention. While the data-base-updating section searches the related approximate expression which corresponds to specific factor information from said related approximate expression database with directions and plots and carries out the display output of the searched related approximate expression concerned It is characterized by correcting said plotted related approximate expression, overwriting said related approximate expression database and storing in it in response to the input of the directions which correct the plotted related approximate expression concerned.

[0018] Moreover, it sets to the estimated support system of the software development cost concerning this invention. The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past

routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation section of software functions which computes the amount of software functions based on the inputted specification information, In the estimated support system of the software development cost which possesses the estimated routing counter calculation section which computes the estimated routing counter as a result of an estimate based on said amount of software functions using the track record information stored in said factor database Said factor database stores the conditions on two or more development as factor information. Said estimated routing counter calculation section receives the input of the conditions on a software development. A track record information retrieval means by which the conditions concerned retrieve the track record information which is in agreement with the conditions shown in said factor information from said factor database, and acquire the group of the track record information on a lot at least, Based on the group of the acquired track record information, it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on said generated related approximate expression including an approximate expression means to generate a related approximate expression.

[0019] Moreover, in the estimated support system of the software development cost concerning this invention, it is characterized by having the communalization exchange section which enumerates and carries out the display output of the functional item whose inputted specification information corresponds.

[0020] Moreover, in the estimated support system of the software development cost concerning this invention, in response to assignment of the functional item deleted among the functional items in which said communalization exchange section enumerated and carried out the display output, the item concerned is deleted from said input section, and it is characterized by outputting to said amount calculation section of software functions as new specification information.

[0021] Furthermore, it sets to the record medium which stores the estimated support program of the software development cost concerning this invention and in which computer reading is possible. The factor database which matches with a group to the factor information showing the conditions on a software development by carrying out the past amount of software functions and past routing counter in a development track record in specific conditions, and is stored as track record information, The amount calculation step of software functions which computes the amount of software functions in response to the input of specification information based on the specification information concerned, The track record information stored in said factor database is used. In the record medium which stores the estimated support program of the software development cost possessing the estimated routing counter calculation step which computes the estimated routing counter as a result of an estimate based on said amount of software functions and in which computer reading is possible It is matched with the same factor information by said factor database, and are stored in it. The related approximate expression database which matches and stores in the factor information concerned the related approximate expression showing the estimated routing counter to the amount of software functions generated based on the track record information on a lot at least is included. Said estimated routing counter calculation step receives the input of the conditions on a software development in estimated creation time. The related approximate expression matched with said factor information corresponding to the conditions concerned is searched from said factor database, and it is characterized by computing the estimated routing counter corresponding to said computed amount of software functions based on the related approximate expression concerned.

[0022]

[Embodiment of the Invention] The gestalt of desirable operation of this invention is explained based on a drawing.

[0023] Gestalt 1. drawing 1 of operation is the configuration block Fig. of the estimated support system concerning the gestalt 1 of desirable operation of this invention. The estimated support system concerning the gestalt 1 of desirable operation of this invention mainly consists of databases 10 possessing an input device 7, the control device 8 possessing the complexity matrix and FP number

calculation table which were shown in drawing 11 , an indicating equipment 9, and the factor database 14 and the related approximate expression database 15, as shown in drawing 1 . Moreover, a control unit 8 contains FP number calculation section 11, the estimated routing counter calculation section 12, and the communalization exchange section 13 as the amount calculation section of software functions of this invention.

[0024] FP number [in / in every / as factor information in which the factor database 14 includes two or more conditions as shown in drawing 2 (a) / factor Flagg (A) / the past development track record], The track record information (B) which made the routing counter the group is stored, and as the related approximate expression database 15 is shown in drawing 2 (b), the related approximate expression (D) beforehand computed from the track record information corresponding to every [as factor information] factor Flagg (C) is stored. Here, FP number is equivalent to the amount of software functions of this invention. Moreover, the routing counter is indicated as a "man day." Drawing 2 is an explanatory view showing the contents of the database 10 of the gestalt 1 of operation of this invention. In addition, although he is trying to store what is equivalent to the ID number of a related approximate expression for every factor information in drawing 2 (b), you may make it store the parameter of a related approximate expression itself.

[0025] Moreover, as two or more conditions for factor information, there is a scale of the information about the field of the invention of for example, development software, the development experience and operating knowledge, and software etc. besides the language ("C", "Java language", etc.) used for development, the version information of those, etc. It is not necessary to necessarily specify the conditions of factor information altogether, and they may be alternatively specified combining conditions. Thus, it uses for arbitration for raising an estimated precision as factor information combining various conditions. In addition, in order to make retrieval easy, it is desirable to express the monograph affair of factor information as 1-bit factor Flagg. A related approximate expression is a formula obtained by performing interpolation and extrapolation based on track record information. Here, a well-known approach is used as the approach of interpolation and extrapolation.

[0026] Hereafter, actuation of the gestalt 1 of operation of this invention is explained about each at estimated creation time and the time of development termination of software. First, actuation of an estimated generate time is explained.

[0027] A control unit 8 performs processing as shown in drawing 3 as processing which computes an estimated routing counter. Drawing 3 is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 8, and drawing 4 is an explanatory view showing the input item to the estimated support system concerning the gestalt 1 of operation of this invention. As shown in drawing 3 , a control unit 8 is in the condition of a chart as indicated to be a processing name to drawing 4 as a functional item in each processing from an input unit 7, and receives the input of some of names of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and the functional item of a document, number of the functional items concerned, and the difficulty of processing (S1). Hereafter, this input item will be called a "questionnaire." Concretely, for every processing, processing of "form information screen" - "Screen 7" is performed as a name of a functional item, and processing of a form information screen expresses that the menu display item whose difficulty of processing the number of items is "common" in "it is common" is displayed in drawing 4 at processing of a "screen."

[0028] a control unit 8 -- a complexity matrix -- being based -- the complexity of the publication of a questionnaire to each functional item -- "simple" -- a "complicated" three-stage "usually" estimates (S2). For example, since the difficulty of processing is "common", the number of items is "usually" estimated that complexity is "common" by processing of "form information screen" from the complexity matrix shown in drawing 11 (a). Moreover, FP number calculation section 11 of this control unit 8 counts the number of each functional items for every complexity (S3). In drawing 3 , the number of the input files (FI) whose complexity is "simple" is concretely counted among "2." It computes the total FP number by FP number calculation section 11 of a control unit 8 carrying out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value which carried out

in this way and was counted, and calculating those sums further (S4). According to complexity, when the number of "2" and ordinary input files is [the number of "5" and complicated input files] "4", the number of simple input files specifically As shown in FP number calculation table of drawing 11 (b), FP number reduced property to a simple input file "3", Since FP number reduced property [as opposed to "5" and a complicated input file in FP number reduced property to an ordinary input file] is "8", $2 \times 3 + 5 \times 5 + 4 \times 8 = 63$ calculate as a subtotal of FP number about an input file. Like the following, about eight kinds of each functional items, the subtotal of FP number is computed and the total FP number is obtained as total of these subtotals. The information showing the class of tools ("C", "Java language", etc.) which use the estimated routing counter calculation section 12 of a control unit 8 for development from an input unit 7, The information showing the existence of development experience, the existence of operating knowledge, the size of a scale, etc. is received as factor information. The related approximate expression corresponding to the factor information concerned is searched from the related approximate expression database 15 (S5), an estimated routing counter is computed by applying the whole FP number to the related approximate expression concerned (S6), and processing is ended.

[0029] When becoming larger than what there were too many estimated routing counters computed in processing S6, for example, order volume was required as, a user starts the communalization exchange section 13 of a control unit 8. The communalization exchange section 13 of a control unit 8 performs processing as shown in drawing 5. Drawing 5 is a flow chart Fig. showing processing of communalization exchange of the communalization exchange section 13. About each of a functional item inputted as a questionnaire, the communalization exchange section 13 is added to a communalization candidate table as shows drawing 6 whether there is the same name or a functional item of the same classes (for example, "input file" etc.) if it searches (S11) and there are such two or more functional items (if it becomes Yes) (S12), and shifts to processing S13. Moreover, in processing S11, if such a functional item is not searched, it investigated whether the retrieval about all functional items was completed (when becoming No) (S13) and retrieval is completed, it shifts to processing S14, and if it has not ended, it will return to processing S11 and processing will be continued (if it becomes No). (if it becomes Yes) Drawing 6 is an explanatory view showing an example of a communalization candidate table.

[0030] If retrieval ends the communalization exchange section 13 and generation of a communalization candidate table is completed, the display output of the communalization candidate table concerned will be carried out to a display 9 (S14). This communalization exchange section 13 investigates whether it is the assignment which deletes some functional items as which it stood by (S15) and the inputted directions displayed the directions from a user by processing S14 again (S16), and the functional item instructed to be the directions to delete from the communalization candidate table deletes (S17), it returns to processing S15 further, and it stands by directions (it is Yes). Moreover, if it is not the directions deleted in processing S16 (it is No), it investigates whether directions are directions of termination (S18), and if it is not directions of termination, it will return to processing S15 and directions will be stood by (if it is No), if it is directions of termination, a questionnaire will be re-created according to a communalization candidate table (if it is Yes) (S19), and processing termination will be carried out. And the estimate shown in drawing 3 is processed, and based on the reconstructed questionnaire, a control unit 8 computes FP number once again, and computes an estimated routing counter further.

[0031] Next, the processing at the time of software-development termination of the gestalt of this operation is explained. Drawing 7 is a flow chart Fig. showing the processing at the time of software-development termination of the gestalt of this operation.

[0032] After development of software is completed, a control unit 8 The factor information as conditions on development of the software which the development concerned ended from the input unit 7, In response to the input of actual FP number and an actual routing counter (S21), the group of the track record information corresponding to the inputted factor information is searched and extracted from the factor database 14 (S22). The track record information concerned, The display output of the actual routing counter to actual FP number newly inputted by processing S21 is carried out to a display 9 as a

scatter diagram (S23). By the well-known interpolation and extrapolation approach Interpolation and extrapolation of the data displayed in the scatter diagram concerned are done, a related approximate expression is generated (S24), a related approximate expression is combined, and a display output is carried out to a display 9.

[0033] A user adds correction to a related approximate expression here, when thinking that the related approximate expression by which the display output was carried out to the display 9 does not suit an actual situation. A part of graph of the related approximate expression displayed on the display 9 is specifically dragged, and the parameter of interpolation and extrapolation is adjusted. If the control unit 8 judged whether the input of correction of a related approximate expression was received (S25) and has received the input of correction, it will return to processing S24, will adjust the parameter of interpolation and extrapolation, will re-calculate a related approximate expression, and it will carry out a display output to a display 9 anew (if it becomes Yes). Moreover, in processing S25, if the input of correction is not received, (if it becomes No) If the directions which judge whether the input of the directions which end processing was received (S26), and end processing are not received, (if it becomes No) If the directions which return to processing S25, continue processing, and end processing are received, (if it becomes Yes) The current related approximate expression corresponding to the factor information inputted by processing S21 is searched from the related approximate expression database 15, the related approximate expression generated by processing S24 is overwritten and stored in the related approximate expression concerned (S27), and processing is ended.

[0034] Since the estimated routing counter is computed using the related approximate expression which could treat two or more conditions as factor information, and was beforehand generated based on the track record information on past according to the gestalt of this operation, an estimated precision can be improved. Moreover, since a related approximate expression is anew readjusted based on actual FP number and the actual routing counter of software which newly ended development at the time of termination of development, the precision of the estimate from next time can be improved.

[0035] Furthermore, according to the gestalt of this operation, by work of the communalization exchange section 13, the duplicate function can be made to be able to show, specification can be made to be able to reconfigure based on directions, and an estimate can be created efficiently.

[0036] Although [the gestalt 1 of operation of the gestalt 2. above of operation] a related approximate expression is beforehand generated and stored for every factor information, when computing an estimated routing counter, it is also desirable to search and generate a related approximate expression based on factor information, and to use the generated related approximate expression concerned. Then, when computing an estimated routing counter, the estimated support system of the software development cost concerning the gestalt 2 of operation of this invention which generates a related approximate expression is explained below.

[0037] The estimated support system concerning the gestalt of this operation is explained referring to a drawing below. In addition, the same sign is attached and explained about the part used as the same configuration as the estimated support system concerning the gestalt 1 of operation shown in drawing 1. Drawing 8 is the configuration block Fig. of the estimated support system concerning the gestalt 2 of desirable operation of this invention. As shown in drawing 8, it mainly consists of the input device 7, a control device 16, an indicating equipment 9, and a database 17. Here, a control unit 16 contains FP number calculation section 11, the estimated routing counter calculation section 12, and the communalization exchange section 13. Moreover, a database 17 contains the factor database 14. In addition, since the contents of the factor database 14 are the same as that of the thing concerning the gestalt 1 of operation of this invention shown in drawing 2 (a), explanation is omitted.

[0038] Hereafter, actuation of the gestalt 2 of operation of this invention is explained about each at estimated creation time and the time of development termination of software. First, actuation of an estimated generate time is explained.

[0039] A control unit 16 performs processing as shown in drawing 9 as processing which computes an estimated routing counter. Drawing 9 is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 16. As shown in drawing 9, a control unit 16 is in the

condition of a chart as indicated to be a processing name to drawing 4 as a functional item in each processing from the input unit 7, and receives the input (the input of a questionnaire) of some of names of an input file, an output file, a I / O file, an input display item, an output display item, an I/O display item, a menu display item, and the functional item of a document, number of the functional items concerned, and the difficulty of processing (S31).

[0040] a control unit 16 -- a complexity matrix -- being based -- the complexity of the publication of a questionnaire to each functional item -- "simple" -- a "complicated" three-stage estimates (S32) and the number of each functional items for every complexity is "usually" counted by FP number calculation section 11 (S33). It computes the total FP number by FP number calculation section 11 carrying out the multiplication of the corresponding FP number reduced property set as FP number calculation table to the numeric value for every functional item counted by processing S33, and calculating those sums further (S34). Moreover, the estimated routing counter calculation section 12 acquires the track record information stored corresponding to the factor information concerned from an input unit 7 in response to the input of factor information (S35), and this control unit 16 generates the related approximate expression as a formula showing the estimated routing counter to FP number by the well-known interpolation and extrapolation approach based on the acquired track record information concerned (S36). And a control unit 16 computes an estimated routing counter by applying the total FP number computed by processing S34 to the related approximate expression generated by processing S36, it carries out a display output to a display 9 (S37), and it ends processing.

[0041] Since it is the same as that of the estimated support system concerning the gestalt 1 of operation of this invention to process communalization as shown in drawing 5 with directions of a user when becoming larger than what there were too many estimated routing counters computed in this processing S37, for example, order volume was required as, that explanation is omitted.

[0042] Next, the processing at the time of software-development termination of the gestalt of this operation is explained. Drawing 10 is a flow chart Fig. showing the processing at the time of software-development termination of the gestalt of this operation.

[0043] After development of software is completed, a control unit 16 The factor information as conditions on development of the software which the development concerned ended from the input unit 7, In response to the input of actual FP number and an actual routing counter (S41), the inputted FP number concerned and an actual routing counter are made into a group, are matched with the inputted factor information, it stores in the factor database 14 (S42), and processing is ended.

[0044] Since according to the gestalt of this operation two or more conditions can be treated as factor information, and a related approximate expression is generated based on the track record information on past and the estimated routing counter is computed using this, an estimated precision can be improved. Moreover, since track record information is accumulated based on actual FP number and the actual routing counter of software which newly ended development at the time of termination of development, the precision of the estimate from next time can be improved.

[0045] Furthermore, according to the gestalt of this operation, by work of the communalization exchange section 13, the duplicate function can be made to be able to show, specification can be made to be able to reconfigure based on directions, and an estimate can be created efficiently.

[0046] In addition, in the gestalt 1 of operation, and the gestalt 2 of operation, although the case where the estimate of a routing counter was created was explained, if the number of the trial items of software, the number of detection of the error in a trial, etc. are accumulated instead of a routing counter as track record information, it is also possible to create the estimate of these numeric values.

[0047] It is also possible to realize the gestalt 1 of operation and the gestalt 2 of operation to the gestalt 3. pan of operation as a program of a computer, and to store this in it at the record medium in which a computer readout is possible.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the configuration block Fig. of the estimated support system concerning the gestalt 1 of desirable operation of this invention.

[Drawing 2] It is an explanatory view showing the contents of the database 10 of the gestalt 1 of operation of this invention.

[Drawing 3] It is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 8.

[Drawing 4] It is an explanatory view showing the input item to the estimated support system concerning the gestalt 1 of operation of this invention.

[Drawing 5] It is a flow chart Fig. showing processing of communalization exchange of the communalization exchange section 13.

[Drawing 6] It is an explanatory view showing an example of a communalization candidate table.

[Drawing 7] It is a flow chart Fig. showing the processing at the time of software-development termination of the gestalt of this operation.

[Drawing 8] It is the configuration block Fig. of the estimated support system concerning the gestalt 2 of desirable operation of this invention.

[Drawing 9] It is a flow chart Fig. showing the processing which computes the estimated routing counter of a control device 16.

[Drawing 10] It is a flow chart Fig. showing the processing at the time of software-development termination of the gestalt of this operation.

[Drawing 11] It is an explanatory view showing an example of the table for computing the amount of software functions.

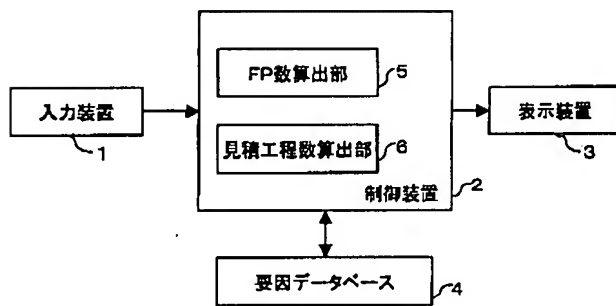
[Drawing 12] It is the configuration block Fig. of the conventional estimated support system.

[Drawing 13] It is an explanatory view showing the input item in the conventional estimated support system.

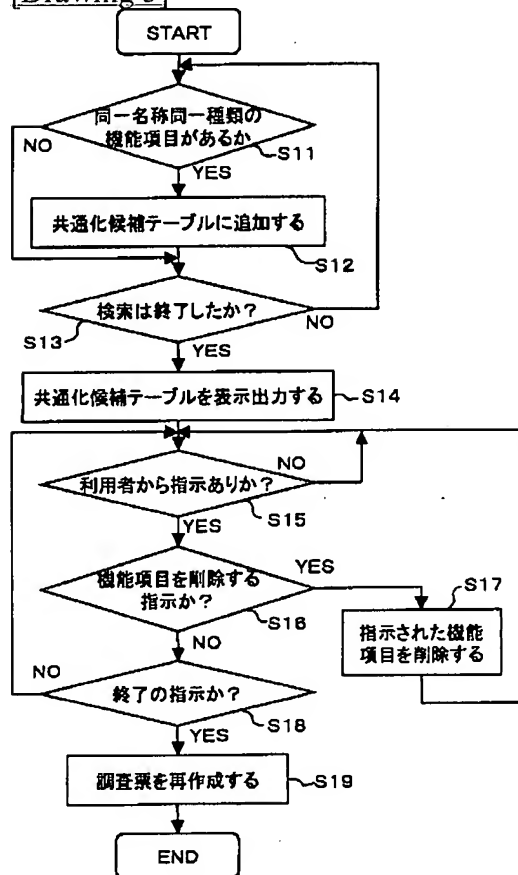
[Description of Notations]

1 Seven An input device, 2, 8, 16 3 A control device, 9 5 An indicating equipment, 4, 14 factor database, 11 6 FP number calculation section, 12 10 The estimated routing counter calculation section, 17 A database, 13 The communalization exchange section, 15 Related approximate expression database.

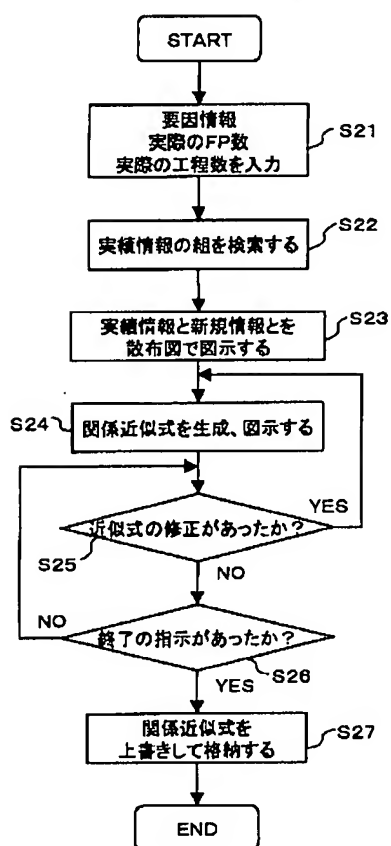
[Translation done.]



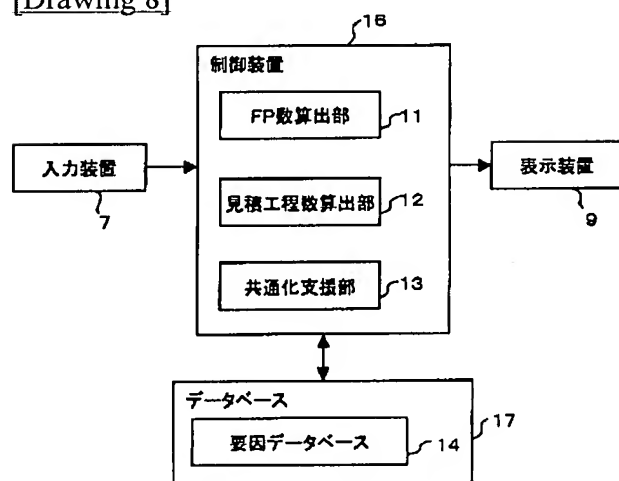
[Drawing 5]



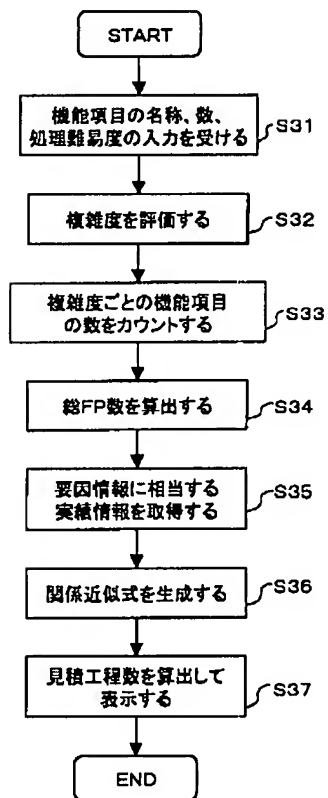
[Drawing 7]



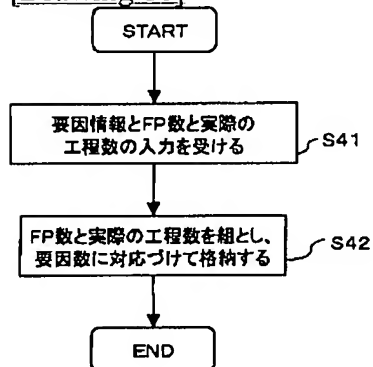
[Drawing 8]



[Drawing 9]



[Drawing 10]



[Drawing 11]

(a) 複雑度マトリクス

項目数	処理の難易度		
	易	普通	難
少	単純	単純	複雑
普通	単純	普通	複雑
多	普通	普通	複雑

(b) FP数算出テーブル

	単純	普通	複雑
入力ファイル	3	5	8
出力ファイル	3	5	8
入出力ファイル	3	6	13
入力画面	3	6	13
出力画面	3	5	8
入出力画面	6	11	19
メニュー画面	2	3	5
帳票	3	6	10

[Drawing 13]

2D/3D外×× 機能量調査表

入力する										入力する										算出される				
No.	処理名 画面	ID	ファイル・画面 名・帳票名	ファイル			画面			メニュー SM	帳票 R	項目数			処理の難易度			複雑度			備考 (画面/帳票種類等)	作成工数 0.5単位		
				入力 FI	出力 FO	入出力 FIO	入力 SI	出力 SO	入出力 SIO			少	普通	多	易	普通	難	単純	普通	複雑				
		S1	画面1										SM			SM			SM					
		S2	画面2				SI						SI			SI			SI					
		S3	画面3						SIO				SIO			SIO			SIO					
		S4	画面4				SI						SI			SI			SI					
		S5	画面5					SO					SO			SO			SO					
		S6	画面6						SIO				SIO			SIO			SIO					
		S7	画面7						SIO				SIO			SIO			SIO					
帳票		R1	帳票1									R	R			R			R					
		R2	帳票2									R	R			R			R					
		R3	帳票3									R	R					R			R			
		R4	帳票4									R	R			R			R					
		R5	帳票5									R			R			R			R			
ファイル		F1	ファイル1	FI									FI		FI			FI						
		F2	ファイル2		FO								FO			FO			FO					
		F3	ファイル3			FIO							FIO		FIO			FIO						
		F4	ファイル4	FI									FI		FI			FI						

[Translation done.]